Erratum to: Canonical coherent states for the relativistic harmonic oscillator, J. Math. Phys. **36**(7), 3191 (1995)

V. Aldaya[1,2] and J. Guerrero[2,3]

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In the mentioned paper [1] we introduced higher-order (non-polynomial), relativistic creation and annihilation operators, $\hat{a}, \hat{a}^\dagger$, with canonical commutation relation $\left[\hat{a}, \hat{a}^\dagger\right] = 1$ rather than the covariant one $\left[\hat{z}, \hat{z}^\dagger\right] \approx$ energy and naturally associated with the $SL(2,R)$ group. The canonical (relativistic) coherent states were then defined as eigenstates of $\hat{a}$. Also, a canonical, minimal representation was constructed in configuration space by means of eigenstates of a canonical position operator.

Unfortunately the expression of the operator $\hat{\kappa}$ (closely related to the energy operator) just after formula (18), then after formula (34), was miswritten. In fact, we printed the classical function of κ in terms of the functions z and z^* (see eq. (2)), whereas the correct, quantum expression is:

$$\hat{\kappa} = \frac{1}{2N} + \sqrt{(1 - \frac{1}{2N})^2 + \frac{2}{N}\hat{z}^\dagger \hat{z}}$$

This misprint had not been detected because we always used the power series expansion (formula (17)), which features a full independence on the (energy eigenstate) basis $\{|n>\}$. However, very recently, H.A. Kastrup dealing with an analogous construction [2] has detected the above-mentioned misprint [3]. We are very grateful to him for pointing it out.

References

[1] V. Aldaya and J. Guerrero, J. Math. Phys. **36**, 3191 (1995).

[2] H.A. Kastrup, *Quantization of the Optical Phase Space* $\mathcal{S}^2 = \{\varphi \ mod \ 2\pi, I > 0\}$ *in Terms of the Group* $SO(1,2)$, arXiv:quant-ph/0307069.

[3] Private communication

[1]Instituto de Astrofísica de Andalucía, Apartado Postal 3004, 18080 Granada, Spain

[2]Instituto de Física Teórica y Computacional Carlos I, Facultad de Ciencias, Universidad de Granada, Campus de Fuentenueva, Granada 18002, Spain

[3]Departamento de Matemática Aplicada, Facultad de Informática, Campus de Espinardo, 30100 Murcia, Spain